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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 27

Application Number: 09/339,616
Filing Date: June 24, 1999
Appellant(s): ALLEN, MARK R.

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Allen Mark R.
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed May 22, 2002.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is erroneous. Claims 2, 3, 11, 12, 17 and 18 are no longer pending as of the entry of the amendment after final. This leaves claims 1, 4-9, 13-16 and 19-28 currently pending.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection with respect to the claims is correct. The amendment after final rejection filed on January 28, 2002 has been entered. As of the entry of the amendment after final, claims 2, 3, 11, 12, 17 and 18 have been cancelled. The examiner disagrees with appellant's allegation that no acknowledgement was given to appellant's request to acknowledge the receipt of Mark Allen's declaration. Since the declaration was submitted along with the amendment, permitting the entry of the amendment after final would inherently admit the receipt of the declaration. The appellant has been made aware that the amendment after final as a whole fails to place the application in conditions for allowance by the advisory action. As such, contrary to appellant's allegation, a clear

acknowledgement was offered by the advisory action to appellant noting the receipt of the declaration.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Grouping of Claims

The appeal does include a group of claims which appellant believes should stand or fall together. However, it is noted that the grouping of the claims contains an error in that it includes claims (2,3,11,12,17 and 18) that have been cancelled as of the entry of the amendment after final. Furthermore, the examiner believes that all claims should be stand or fall together since appellant fails to provide a compelling argument supporting otherwise.

(7) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is erroneous. Claims 2, 3, 11, 12, 17 and 18 have been cancelled upon entry of the amendment after final. This leaves claims 1, 4-9, 13-16 and 19-28 pending.

(8) Prior Art of Record

5,941,626	Yamuro	8-1999
5,936,599	Reymond	8-1999
5,887,967	Chang	3-1999
3,758,771	Frohardt et al.	9-1973

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 4-9, 13-16, 19-28 are rejected as follow:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 9, 14-16 and 25 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Yamuro (US Pat. 5,941,626).

Yamuro discloses in Fig. 1B an electronic circuit powering a predetermined number (6) of light emitting diodes (4) electrically coupled in series to form plurality of series blocks (4, 5) in parallel, wherein the first LED and the last LED in one series block directly coupled to an intermediate pair of wires via a resistor (8) which are electrically connected to an alternating current power supply (9) by connectors (2, 3), the LEDs in series blocks are connected in polarity thereby coupling of multiple light strings in an end-to-end straight arrangement relatively to a wire axis, whereas there are approximately 50 LEDs in series block and are constructed in uniformly spaced apart (Fig. 1B) (col. 3, lines 10-45).

Even though this figure shows one end of the diode block being tied to the source via the resistor, by its natural layout, it fulfils applicant's definition of having this block directly ties to the source. During operation, this resistor also serves the electrical conducting function which would allow the current to flow directly from one end to another without a detour passage.

Alternatively, the claimed invention has been viewed as an obvious variation in design choice over Yamuro in view of the fact that line 37, column 3, in this teaching clearly lays out a desire for doing away with the resistor connection if needed. Even though figure 1B shows the usage of a resistor to stabilize the operation of the system, it's teaching, however, specifically leaves the option of using this resistor to one of ordinary skill in the art. In the interest of making the design of this circuit feasible, one of ordinary skill in the art would have considered it a routine design choice to alleviate this resistor. Applying the design without the resistor as suggested in a massive production environment, this would mount up to a considerable saving in the production line.

Yamuro does not explicitly mention that each LED having an average alternating current drive voltage and being provided by an alternative current voltage. Nonetheless, the inclusion of these features is considered as an obvious variation in design choice, since power distribution to commercially available LEDs is subject to the make up of the LEDs. In another word, should one attempt to distribute different forms of power system than an average alternating current drive voltage to a conventional light system such as found in Yamuro, undesirable output would occur, which may result in shortening the life of the LEDs. In view of this reasoning, it is the examiner's position that operating LEDs with an average alternating current drive voltage is an unavoidable step which one must take into account in prolonging the life of LEDs. As such, one of ordinary skill in the art would have considered it obvious to implement the source found in Yamuro with a conventional average alternating current drive voltage in the interest of maximizing the service of Yamuro's LEDs.

3. Claims 4, 6-8 and 21-24 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Yamuro in view of Reymond (US Pat. 5,936,599).

Yamuro discloses substantially the claimed invention as noted above. However, Yamuro does not teach an electrical power supply to provide an alternating current having an alternating current voltage in the range of about 110V- 220V operated in at least 50 Hz.

Reymond discloses an electronic apparatus for AC powered light emitting diode comprising an AC power source of 120 V at 60 Hz supplied to the LEDs load.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the wide range power source taught by Reymond when constructing Yamuro's lighting system in the interest of making Yamuro's lighting system universally compatible with widely available standardized power supplies.

Because human eyes perceive light as a continuous waveform without flickering at a frequency of above 4Hz, it would be desirable to control the emitting of LEDs above this frequency. As such, to avoid noticeable flickering to human eyes, one of ordinary skill in the art would have considered it obvious to emit Yamuro's LEDs at a frequency of above 4 Hz, preferably industrial standard of about 60Hz.

With respect to claims 21- 24, the choice of a 100-LED or a 50-LED merely represents an obvious matter of design choice based upon implementation requirement as well as simply mathematical manipulations. Although, neither Yamuro nor Reymond limits their construction design to a 100 in a series block, any artisan designing such circuit would have known to vary the total number of LEDs to suite the implementation, should it required the exact number of a 100 of LED. To sufficiently power either a 100-LED or a 50 LED in Yamuro, one of ordinary skill in the art would have recognized to either provide a commercially available 220V source or 110V source, respectively, since doing so merely involves a routine mathematical manipulation. In particular, one of ordinary artisan would have found it a routine design choice to power 50 LED's with an AC electric power source of 110V. The same holds true for powering a 100-LED. One of ordinary skill in the art would have recognized matching a 100-LED light block with a 220V source, thereby ensuring sufficient energy being driven to each LED.

4. The rejection applied to claims 11, 12, 17 and 18 under 35 U.S.C. 103 (a) as being unpatentable over Yamuro is now **moot**. Appellant has been informed of the cancellation of these claims upon entry of the amendment after final by the advisory action mailed 03/05/2002.

5. Claim 5 is rejected under 35 U.S.C. 103 (a) as being unpatentable Yamuro in view of Reymond.

Yamuro in view of Reymond discloses substantially the claimed invention as noted above except that each LED has a p-n defining break down voltage above which voltage applied in reverse bias the p-n junction break down, and in which light string having the alternating current voltage is less than the break down voltage. Applying a voltage less than a specified break-down voltage across the p-n junction of each LED such as defined in claim 5 would appear to be a inherent manufacturing criterion. As such, if the same reverse bias is required in each LED shown in Yamuro, anyone of ordinary skill in the art would have recognized the advantage of closely following such a requirement, thereby avoiding unnecessary breakdown of the LED's. Operating it otherwise would destroy the diode device since the significant reverse current accumulated between cathode to the anode of each diode from the AC power supply above a break-down voltage will unavoidably generate undesirable heat from the overloaded current.

6. Claims 13 and 28 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Yamuro in view of Frohardt et al. (US Pat. 3,758,771), hereinafter Frohardt.

Yamuro discloses substantially the claimed invention in claims 1 and 11 as noted above. However, Yamuro does not teach a lossy fiber optic rod having a diameter equal to a diameter of a corresponding LED lens within a fiber house for creating an optical icicle feature. Figure 2 of Frohardt demonstrates that it is well-known to conduct light with a bundle of optical fibers (30) for enhancing long range light illumination without loss or interference. In view of this advantage, one of ordinary skill in the art would consider it a routine design choice to enhance the light conductibility of Yamuro's LEDs. Frohardt, however remains silent regarding the use of a lossy fiber optic rod with a diameter that corresponds to the diameter of a LED lens such as defined in claim 28. Be that as it may, the examiner maintains conducting light with a fiber having a diameter that corresponds to the diameter of the LED lens is obvious and desirous in view of the superior light conductibility of a single fiber over a bundle of fibers.

7. Claims 19, 20, 26 and 27 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Yamuro in view of Chang et al. (US Pat. 5,887,967), hereinafter Chang.

As noted above, Yamuro teaches every feature of the claimed invention except for the particular mounting structure of which a keyed offset. Chang teaches a mounting structure with a keyed offset to ensure proper alignment between a bulb holder and the base of the bulb.

To prevent incorrect insertion of the bulbs, one of ordinary skill in the art would have considered it obvious to improve the mounting structure of Yamuro lighting bulbs with Chang's alignment system. In doing so, proper operation of the lighting system is a guarantee.

Response to Argument with respect to the 1st Rejection

The fundamental difference between the views of the appellant and of the examiner evolves from the disagreement with respect to the understanding of a "direct" electrical connection. In particular, the appellant insists upon interpreting "direct" electrical connection such as recited in several places of claim 1 to be free of any intervening electrical elements; whereas to the examiner, this is nothing more than any form of electrical conduction between two adjoining points. In the examiner's view, a "direct" connection between two adjoining points may optionally include electrical elements that ultimately permit passing of electrical current.

As laid out in detail in the examiner's rejection, Yamuro et al. Clearly teaches all aspects of the claimed invention as shown in figure 1B. Like the claimed invention, this figure clearly shows a predetermined number of light emitting diodes (6) tied in series to form a number of serially connected blocks (4, 5). Wherein one end of each block is ultimately tied to a source end (9) and the remaining end of each block is tied to the terminal end.
As an illustration of this interpretation, figure 1B has been reproduced below for clarification.

As it can be seen from the above illustration, the only distinction between claim 1 and Yamuro's figure 1B stems from the fact that a resistor (8) has been shown as an optional choice that ties each serially connected block to the source. However, such a distinction is so minor that it renders claim 1 unpatentable for the reasons noted in the rejection and will be repeated as follows. In the examiner's understanding, resistor (8) does function as a direct electrical connection. In a broad interpretation, figure 1B clearly anticipates claim 1 in that the resistor does form a direction connection between the source and the LEDs . Alternatively, should figure 1B not anticipate claim 1, the language in lines 32-38, column 3 Yamuro clearly renders it unpatentable and obvious, as the language clearly teaches having resistance (8) as being optional in certain country like Japan, where power is more stable. Anyone of ordinary skill in the art reading this teaching would have considered it desirous and obvious to form a series of LED's as taught by Yamuro to minimize cost of constructing the light string.

For the above reasons, claims 1-3, 9, 14-16 and 25 have been unpatenable over Yamuro under 35 103. It is within these reasons that rejection should be affirmed.

In an alternative dispute, appellant refutes that calculating the average alternating drive current to be distributed through the LED's would not have been obvious as it would not have been within the skill in the art to have done so based upon Yamuro. In supporting this argument, appellant states that the claim recites a formula for determining the number of LEDs to be used and Yamuro does not concern itself with this issue. This argument is flaws for the following three reasons.

Firstly, none of the claim clearly sets forth the formula as suggested by appellant. Secondly, it is believed that the LEDs shown in Yamuro as being connected in the same manner as claimed by appellant would dictate the electrical conduction to be behaved in the identical manner as suggested. Without an explicit teaching in Yamuro, the examiner believes all current to be distributed throughout the LEDs strings or blocks shown figure 1B would inherently be averaged. This is because all current passing through parallel-connected blocks should inherently be distributed equally. This basic electrical conduction principal supports the examiner's believe that all current received by each LED in Yamuro is being averaged equally.

Finally, the examiner maintains that one of ordinary skill in the art of lighting design would have considered it obvious and desirous to ensure not exceed manufacture current specification while driving current through the blocks of LEDs shown in figure. Exceeding manufacturing specification would cause instability power being driven through each block that would consequently shorten the service life of LEDs. For this obvious reason, one of ordinary skill in the art would have found it a routine design choice to average the current to be distributed over the LEDs shown in Yamuro to maximize the service life of each LED.

In view of the above, sustaining the examiner's rejection applied to the aforementioned claims is believed to be proper.

Response to Argument with respect to the second rejection

In this argument, appellant elaborated in detail as how to how Reymond fails to compensate for what has been lacking in Yamuro by expounding on how the circuitry in Reymond is simply incompatible with Yamuro. This argument is nothing more than the intention of misleading the examiner's position. In fact, Reymond has merely been cited to demonstrate that power supply within the range (110-220v) claimed by appellant is conventional and commercially available. Based upon its availability, one of ordinary skill in the art would found it convenient incorporate the power supply shown in Reymond when driving the circuitry shown in Yamuro, thereby simplifying the Yamuro's designing process.

Responses to Arguments with respect to the Fourth, Fifth and Sixth Rejections

Appellant maintains in this argument that designing the circuitry shown in Yamuro without using the resistor would fail due to instability. With this, appellant refutes the examiner's

position that excessive heat distributed throughout the LEDs in Yamuro will cause a malfunction. It is the examiner's position that excessive heat could accumulate throughout LEDs as a result of disregarding the manufacturing PN voltage distribution. In supporting appellant's argument, a sarcastic remark has been raised as to how one would discover the so-call excessive heat if the system fails.

In response, the examiner believes that if building the system shown in Yamuro without a resistor causes an instability that would ultimately result in a malfunction, then the examiner believes that appellant's invention would unavoidably suffer the same deficiency. This is because the circuitry now claimed by appellant contains all identical features and arrangements as that found in Yamuro. Since appellant insists that designing a parallel connected LED blocks without the use of a resistor proves too unstable, then any design baring the similarities would presumably be inherited the same flaws.

With respect to the fifth argument, the examiner contends that Frohardt alone sufficiently shows the use of fiber optic matching the size of the LED in Yamuro to transmit light remains well known in the art. The examiner further maintains that the use of such convention gadget to conduct light remains obvious and desirous for the purpose of extending the length of the output of Yamuro's light. Likewise, the examiner maintains that including a mounting structure similar to that as shown in Chang to hold all LEDs together would have been obvious to any artisan of light design for the purpose of fastening all elements together.

The argument asserting the difference between the claimed invention and Chang is disagreed. In particular, appellant alleges that the dint in Chang fails to assure a correct alignment in the same manner as claimed. In supporting this argument, dint Chang has been alleged as being formed for mere visual alignment without encountering the possibility of human error. This argument has not been found to persuasive in view of the following.

Much like the keyed offset as defined by the claimed invention, the dint (21, 31) and lead (41) in Chang do prevent incorrect insertion of the bulb into the base holder. Even though Chang does not specifically mention that such an alignment mechanism would ensure correct polarity, nonetheless it is implied that incorrect insertion of the light bulb into the holder would render the light system inoperative (col. 2, lines 1-14). Based upon the strict insertion requirement, matching polarity between the holder and the base upon insertion is an implicit feature found in Chang.

Response to the Secondary Consideration

Both declarations filed March 21, 2001 fail to present a compelling argument that the invention as claimed is not a duplicate of Yamuro. The commercial success which appellant may have enjoyed does not alter the fact that the invention is an obvious design of Yamuro. This is supported by the fact that Yamuro does offer the suggestion of making the same lighting system without the limiting circuit in country where power distribution can be done in a stable manner.

Demonstrating the potential interest of others does not constitute absolute proof of appellant's break through. In fact, it merely demonstrates that these people have no knowledge of Yamuro's teaching exists much before to the claimed invention.

For the reasons as set forth above, the examiner maintains that the claimed invention is simply NOT patentable and that all rejections should be sustained.

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Respectfully submitted,

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August 24, 2002

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